



Tight oil and shale gas – global implications

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Christof Rühl, Chief Economist, BP

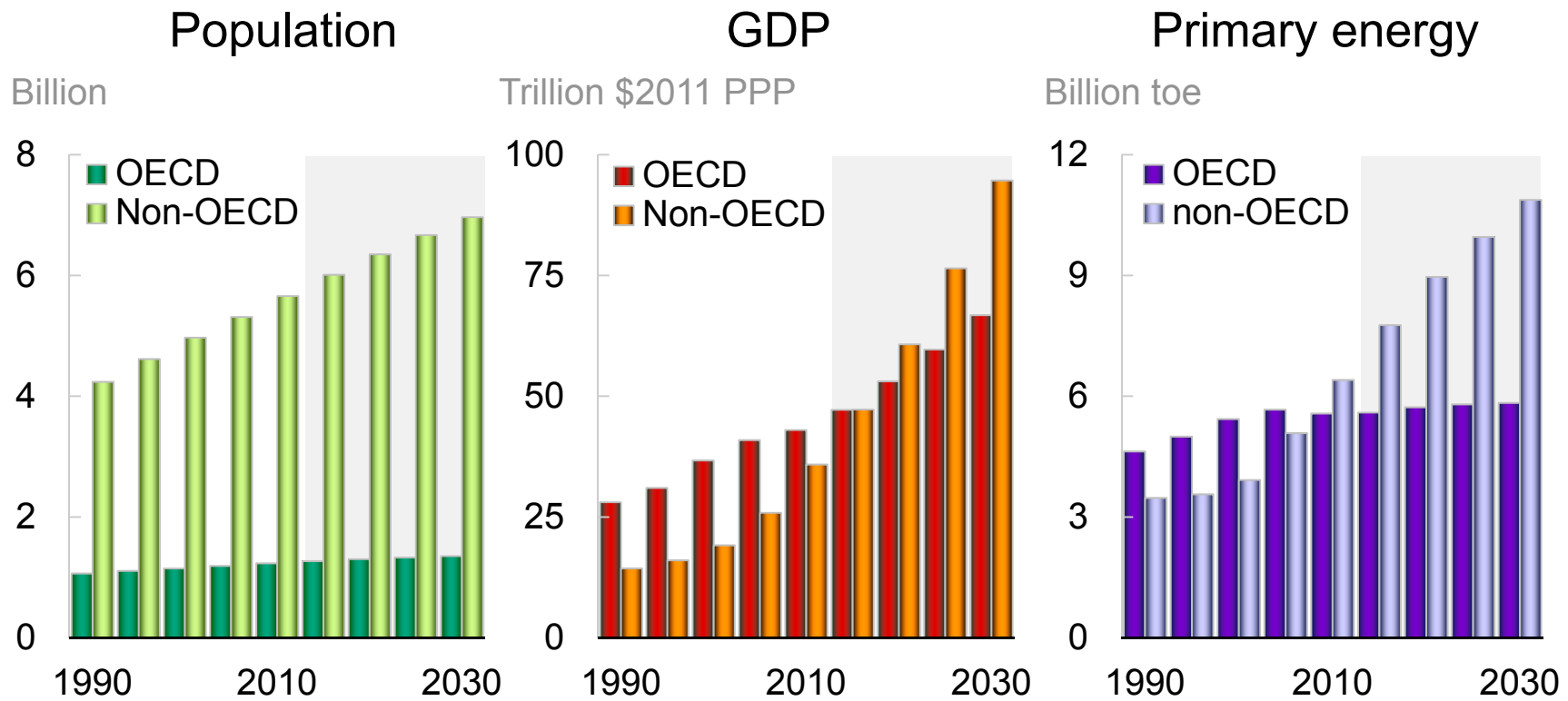


Tight oil and shale gas: global implications

Global energy trends

- Characteristics
- Implications

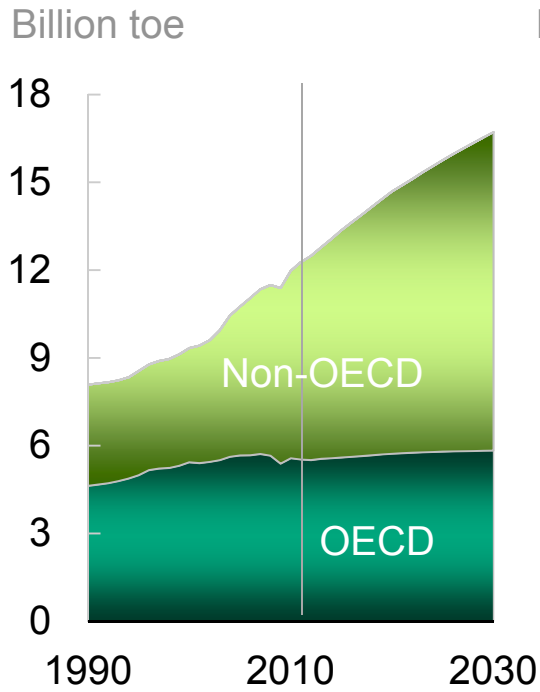
Population, income and energy growth



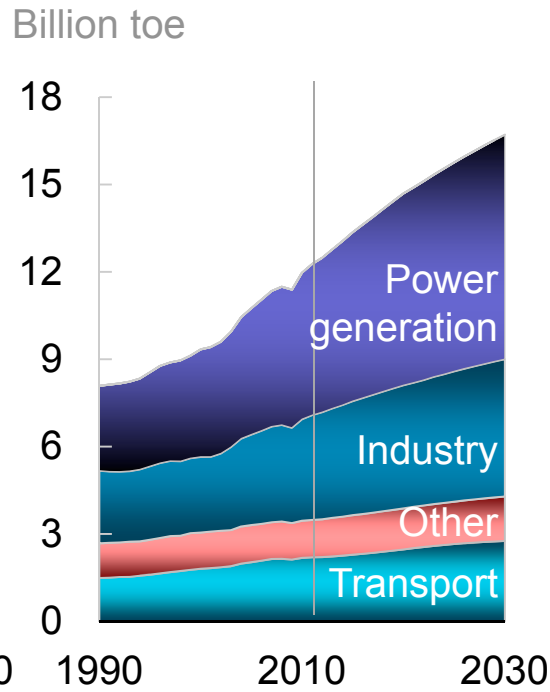
Industrialisation drives energy growth



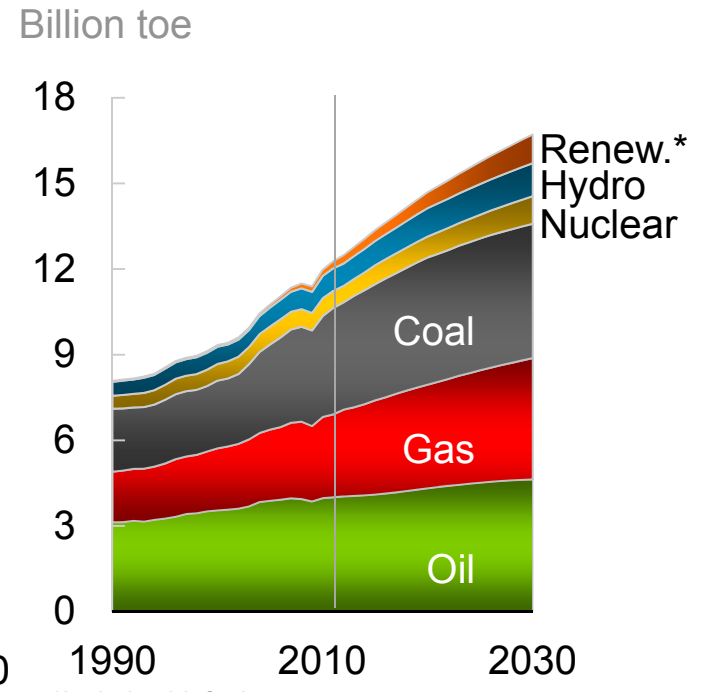
By region



By primary use



By fuel

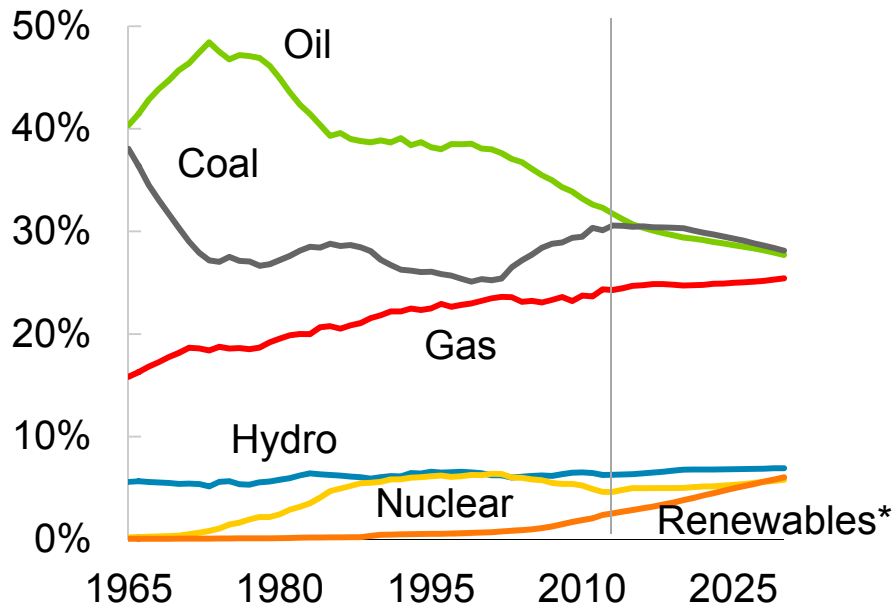


*Includes biofuels

Fuel shares and energy prices

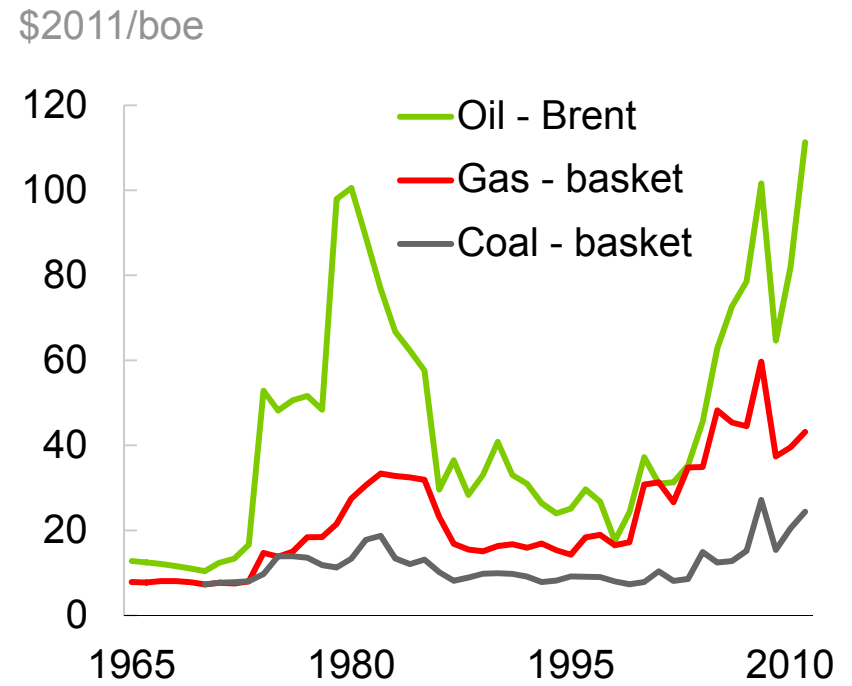


Shares of world primary energy



*Includes biofuels

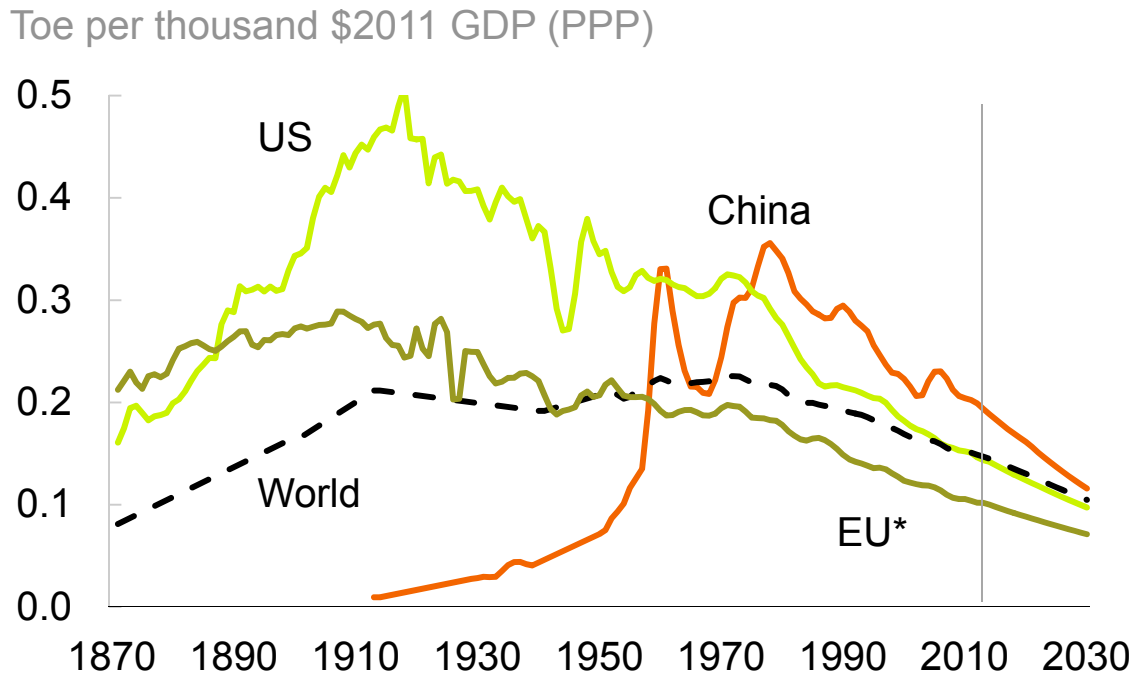
Energy prices



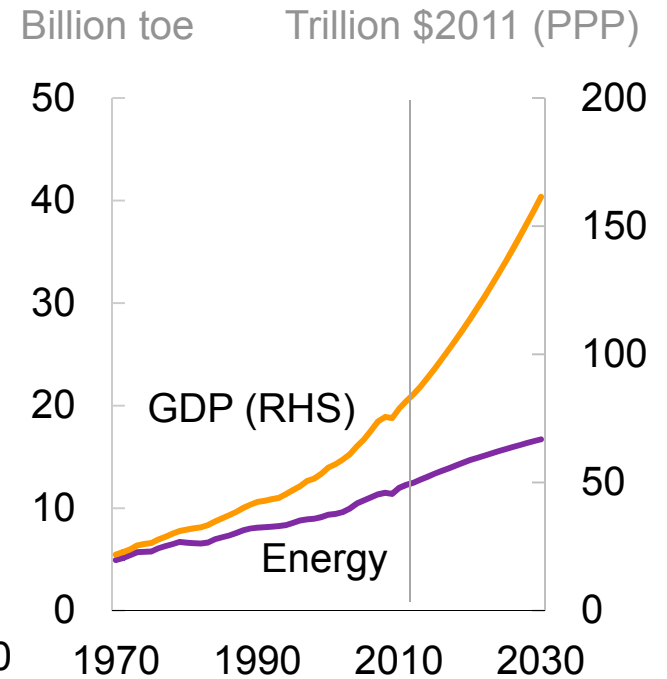
Energy efficiency improvements



Energy intensity by region

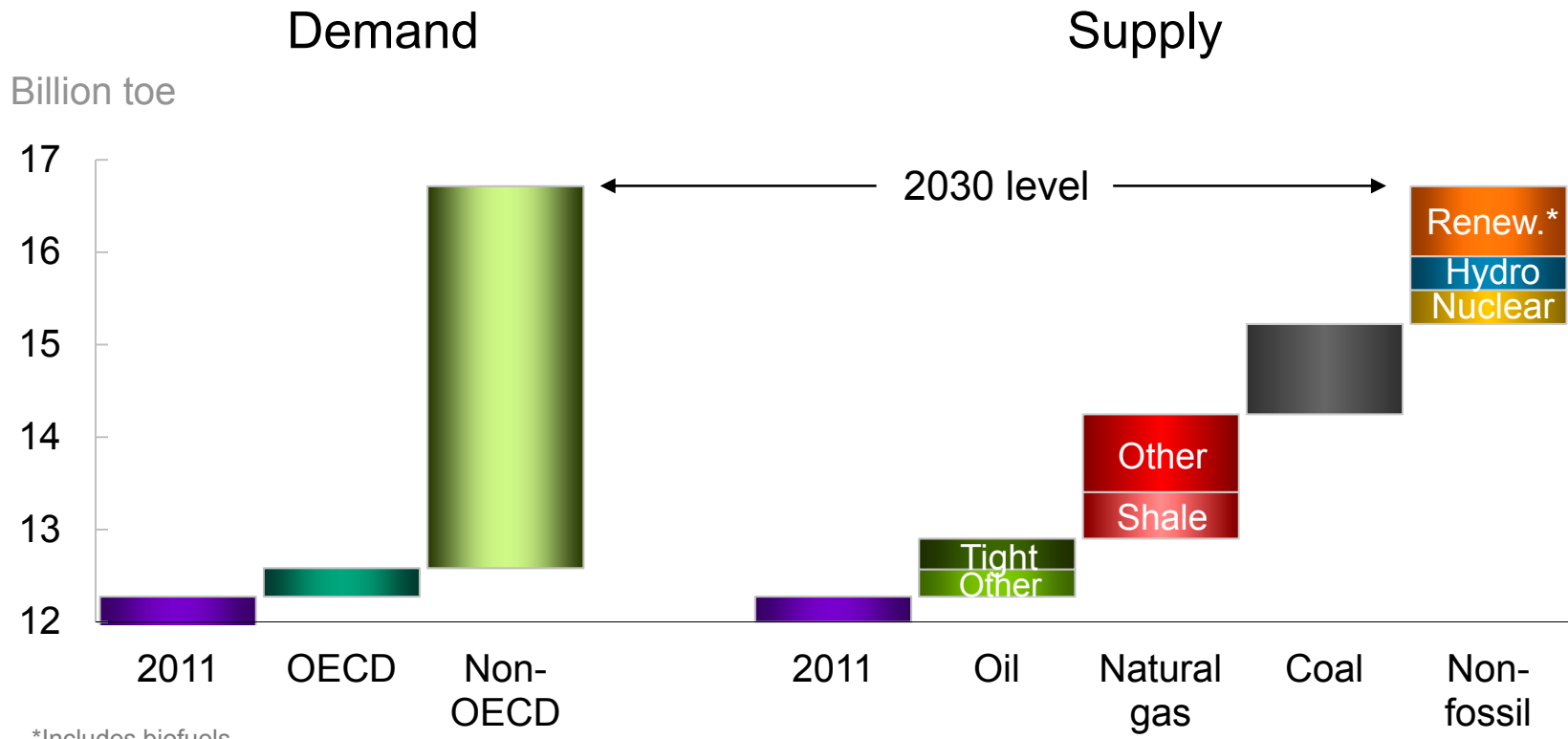


Energy and GDP



*Euro4 (France, Italy, Germany, UK) pre-1970

Energy supply growth



*Includes biofuels



Tight oil and shale gas: global implications

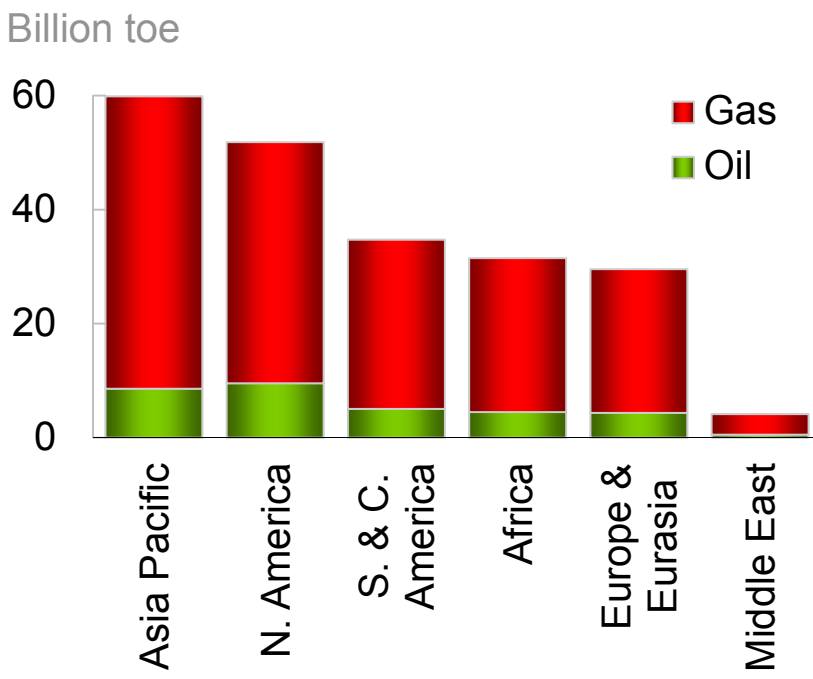
Global energy trends

- **Characteristics**
- Implications

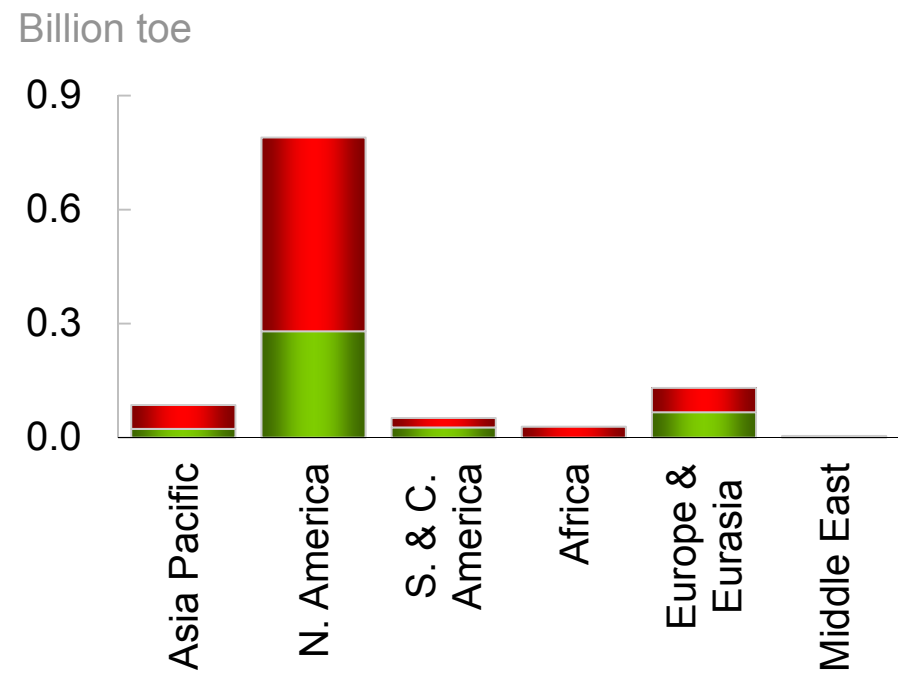
Tight oil and shale gas: resources and production



Current resources



Production in 2030



Resources data © OECD/IEA 2012

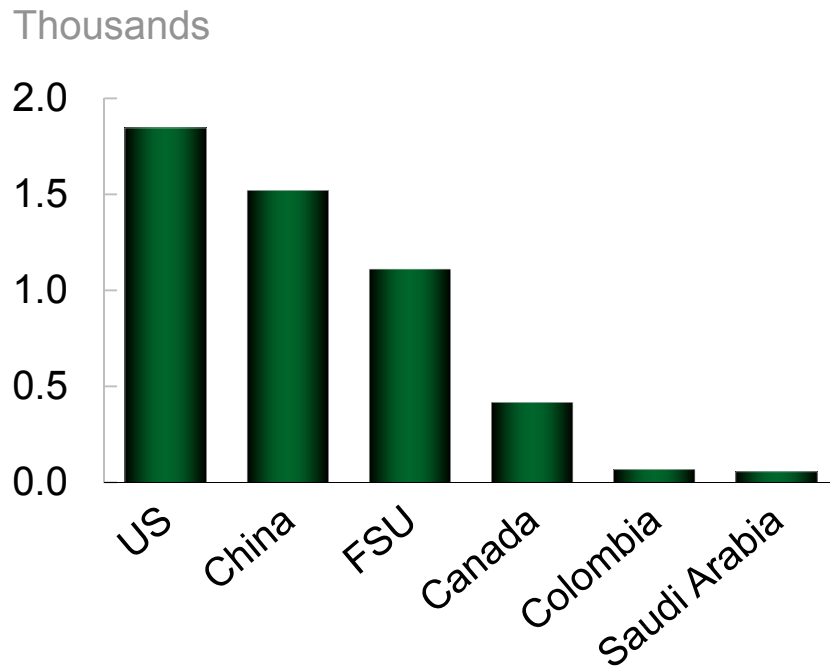
Energy Outlook 2030

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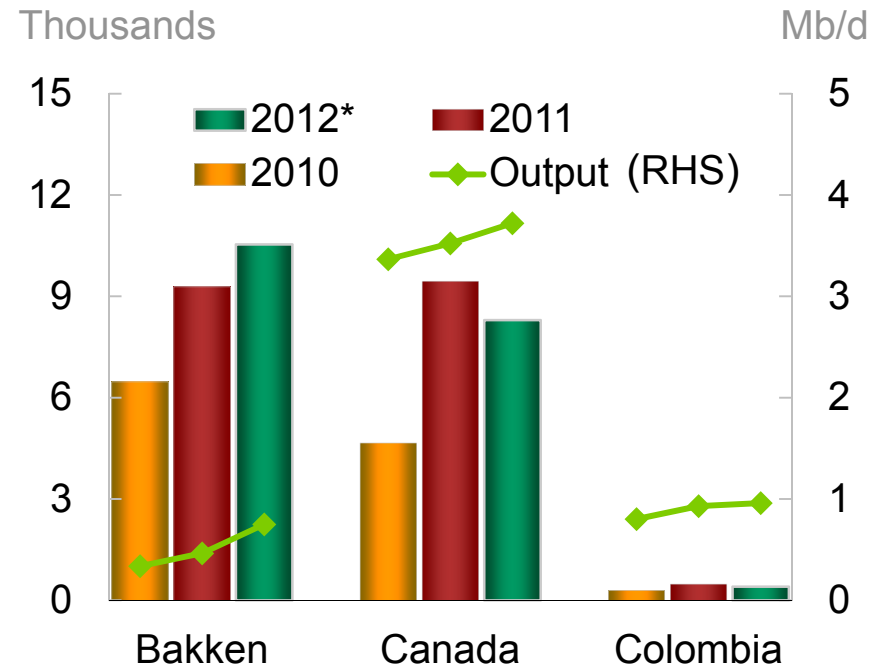
US tight oil and shale gas: infrastructure requirements



Onshore oil & gas rigs 2011



Oil wells drilled and output

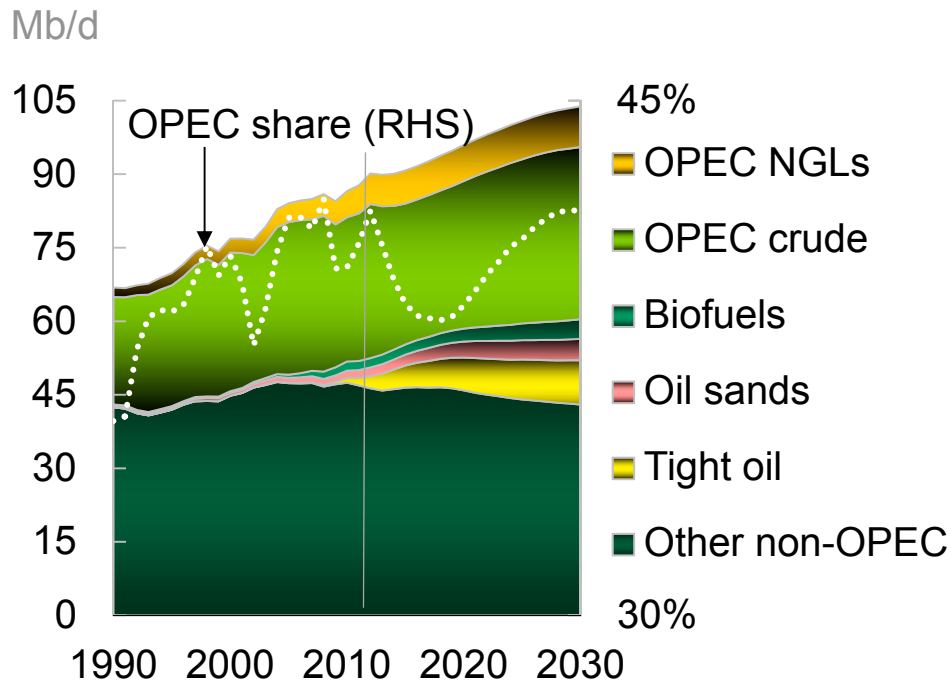


*Annualised from 1Q-3Q data

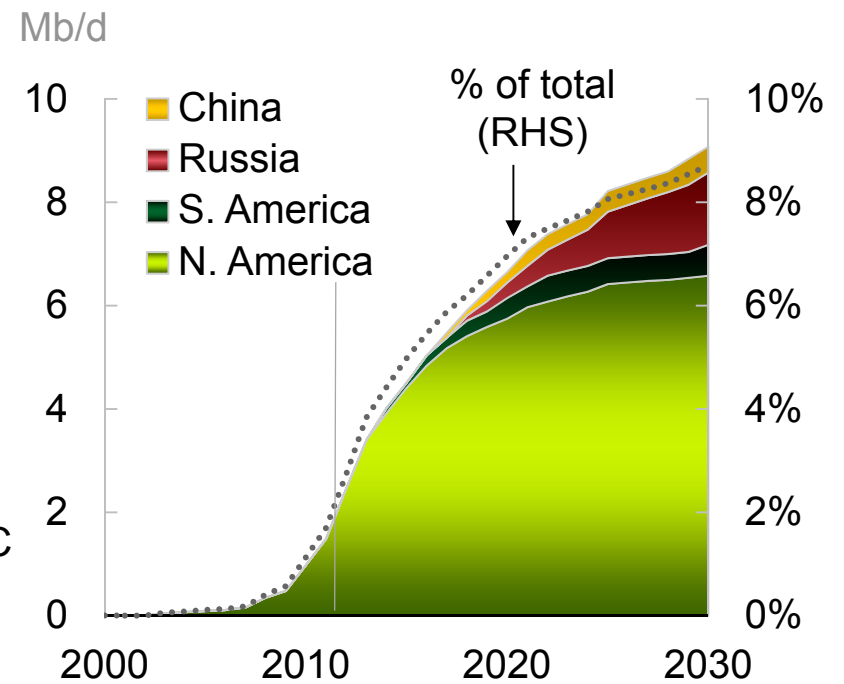
Global supply growth and tight oil



Liquids supply by type



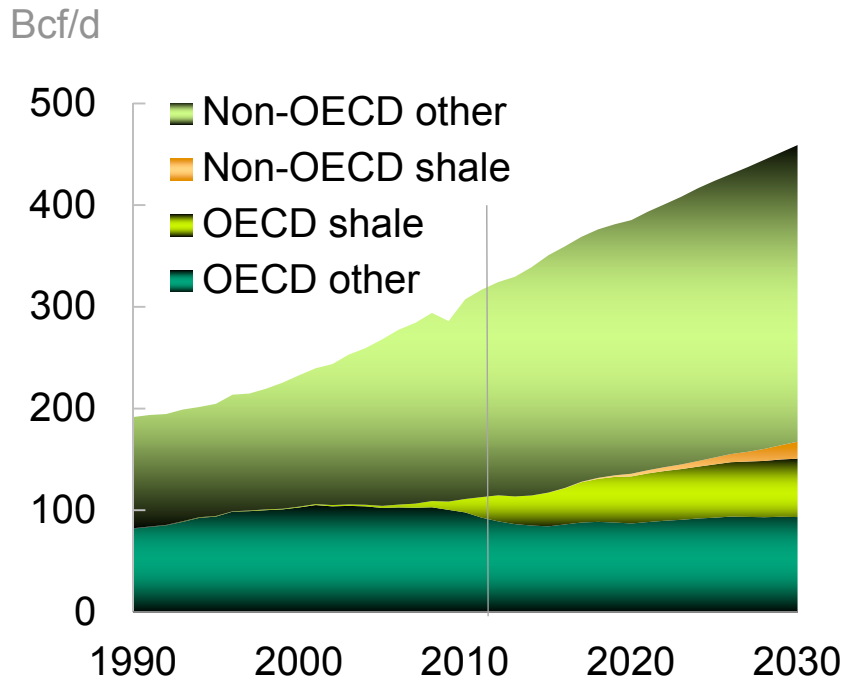
Tight oil output



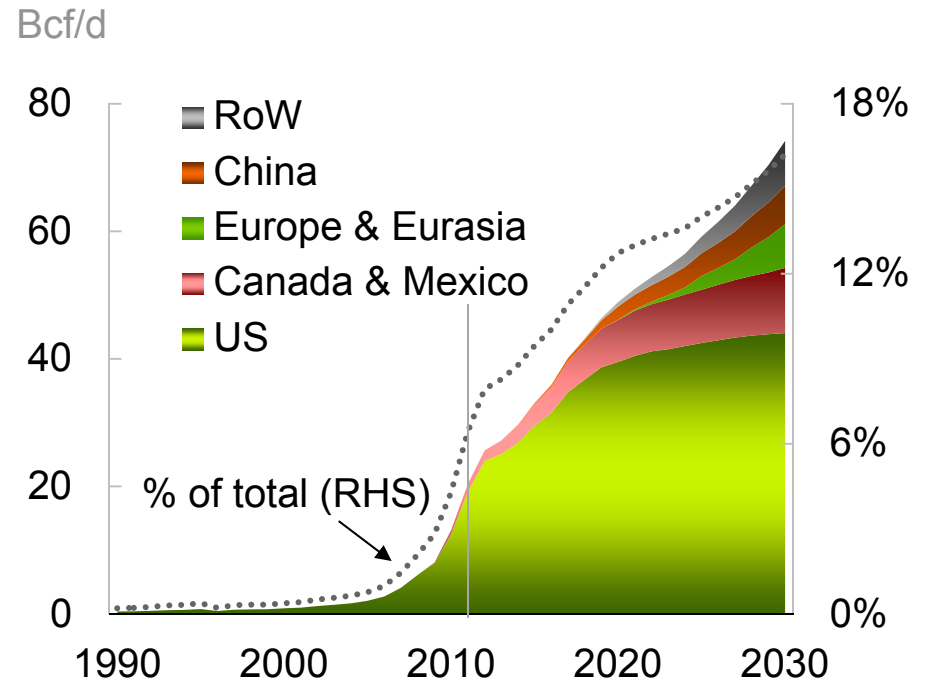
Global supply growth and shale gas



Gas production by type and region



Shale gas production





Tight oil and shale gas: global implications

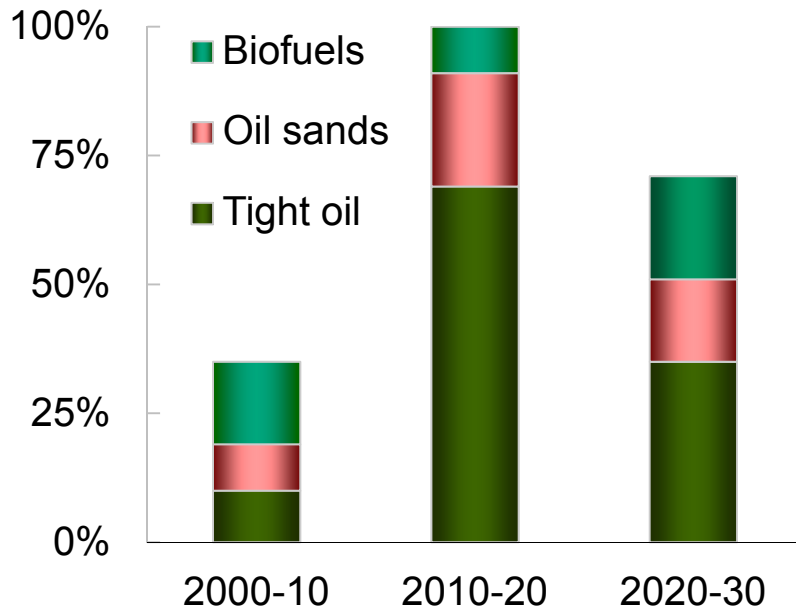
Global energy trends

- Characteristics
- **Implications**

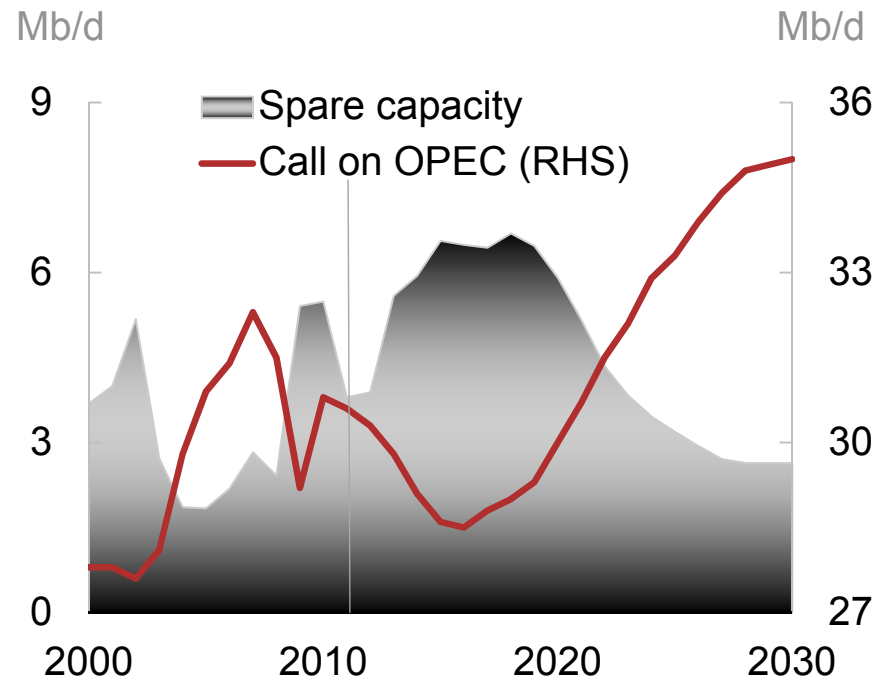
Unconventional oil and the call on OPEC



Unconventionals share of net global supply growth



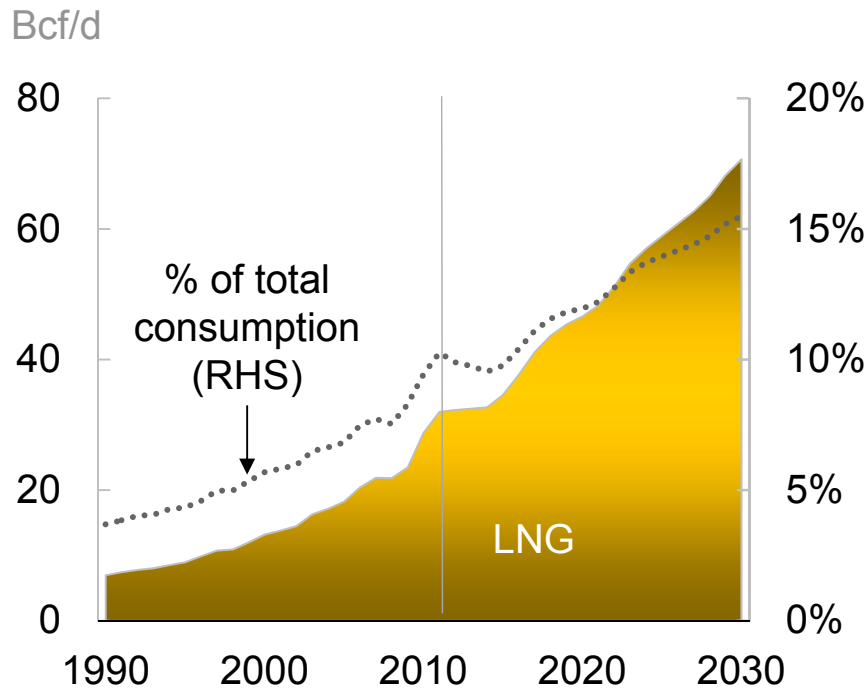
Call on OPEC & spare capacity



Gas trade and market integration



LNG exports



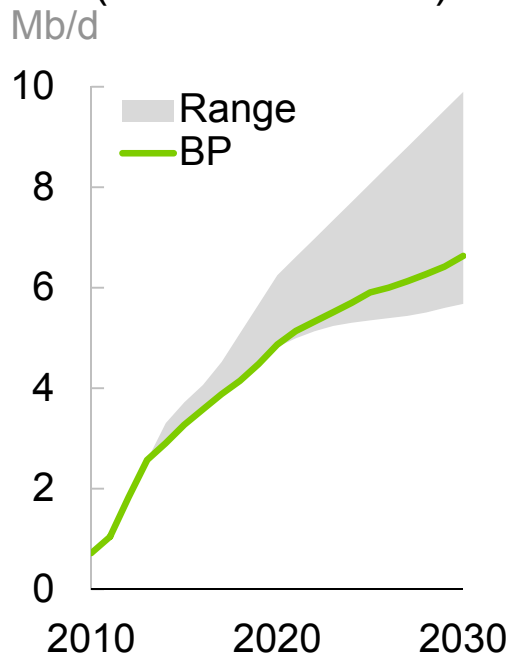
LNG diversification



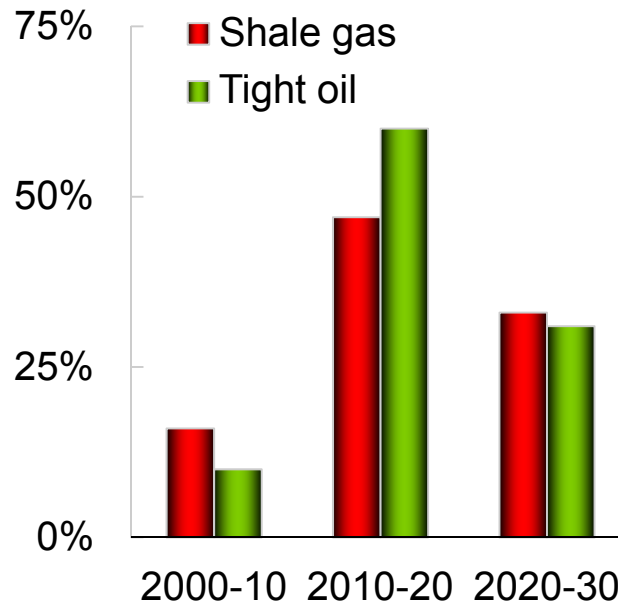


Tight oil and shale gas uncertainties

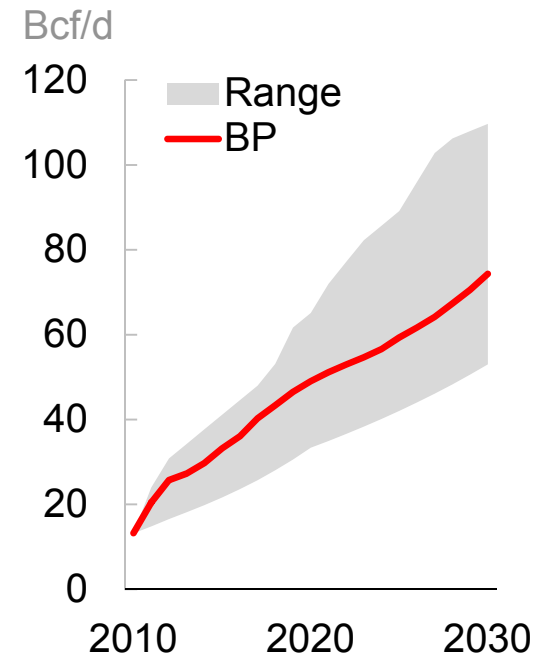
Range of tight oil forecasts
(excludes NGLs)



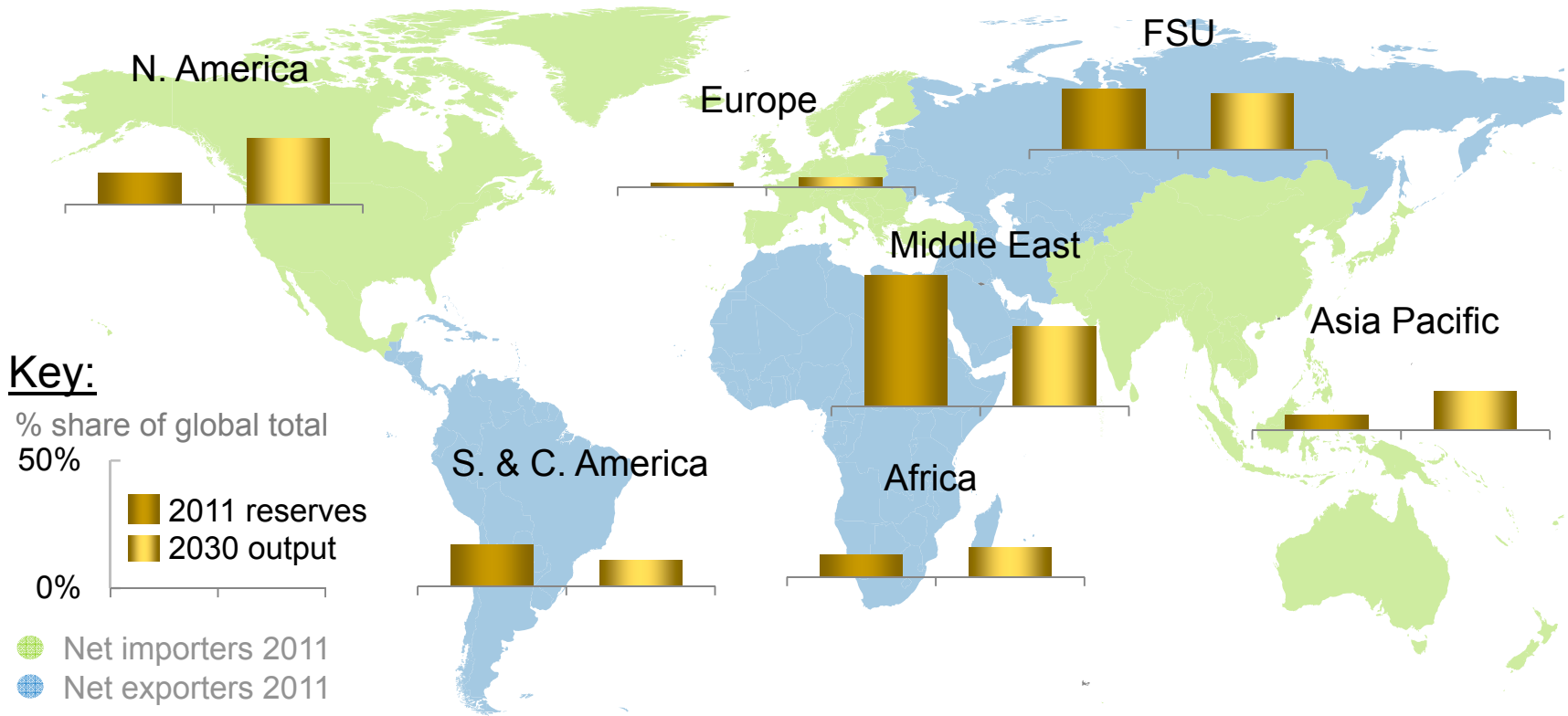
Share of global supply growth



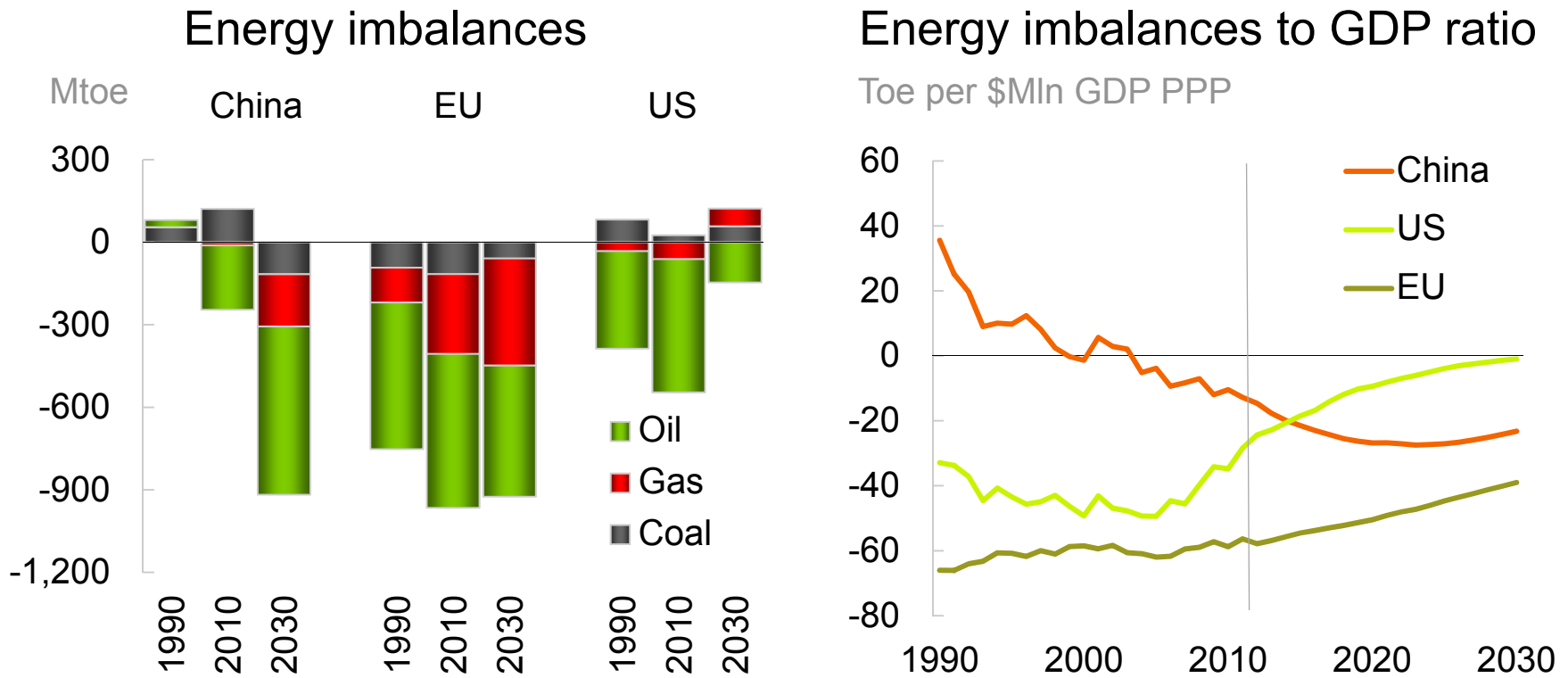
Range of shale gas forecasts



Oil and gas: reserves and production

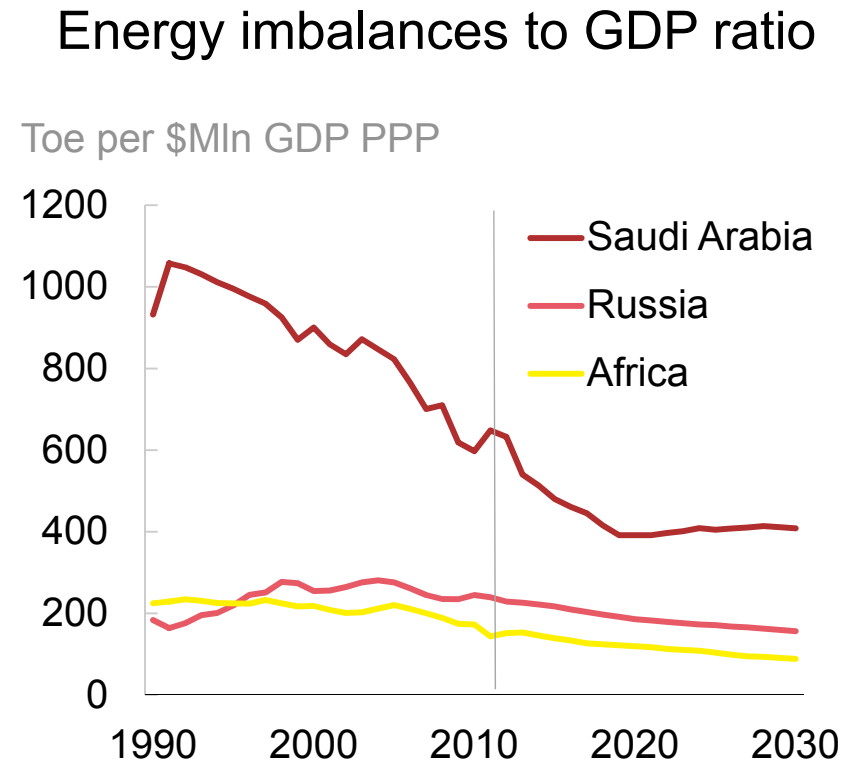
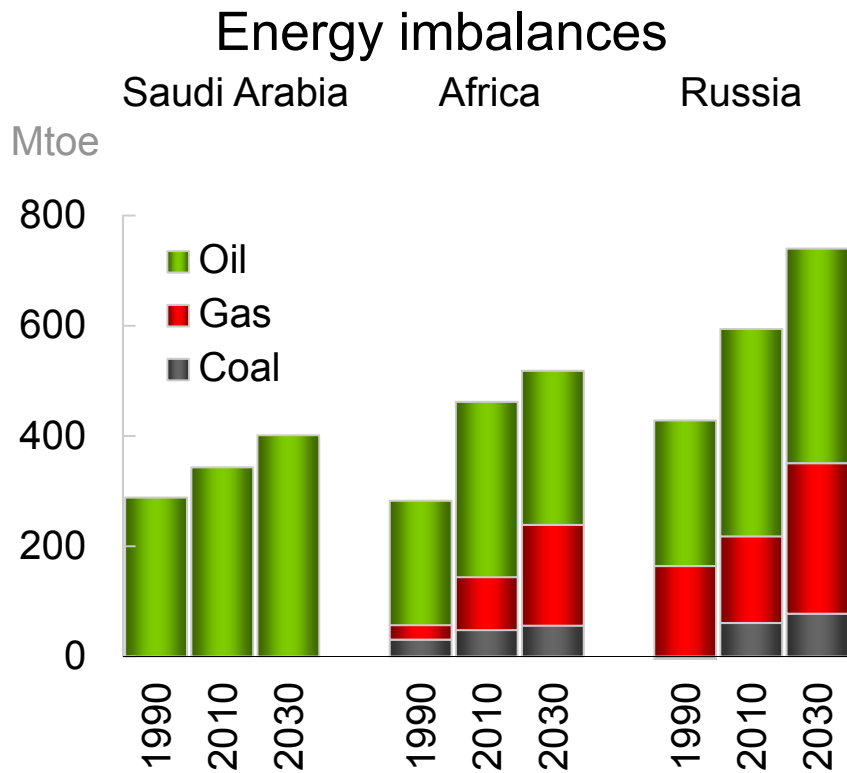


Energy imbalances: import profiles





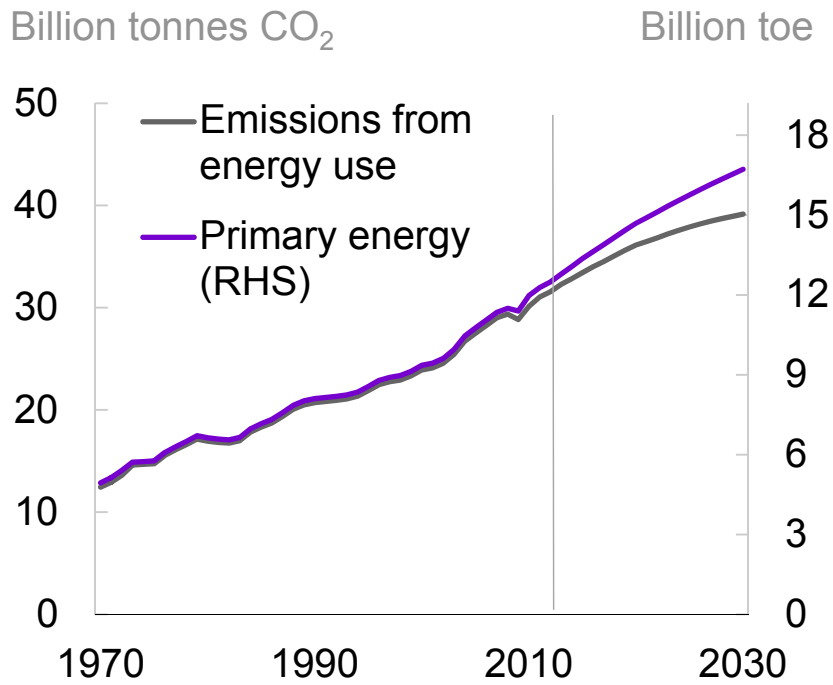
Energy imbalances: export profiles



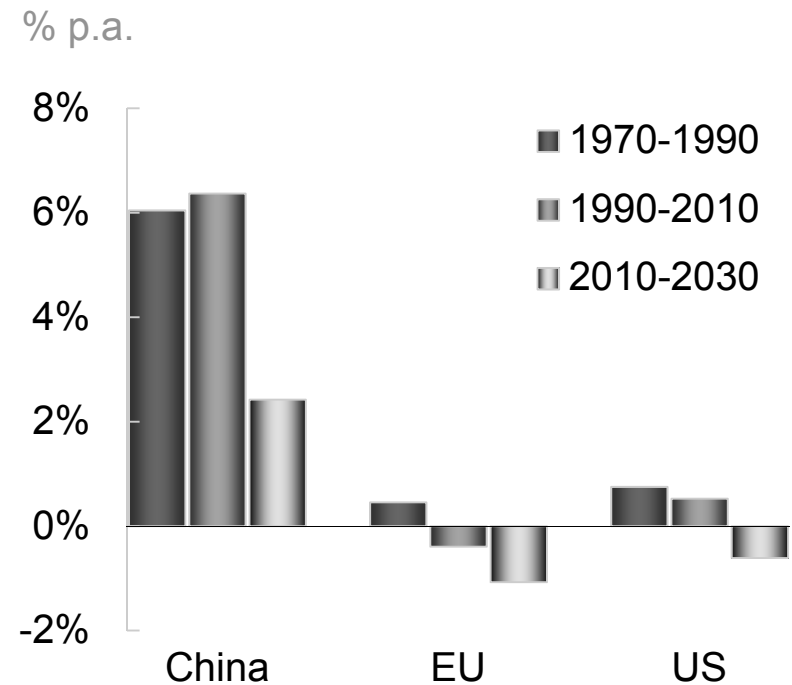
Energy and carbon emissions



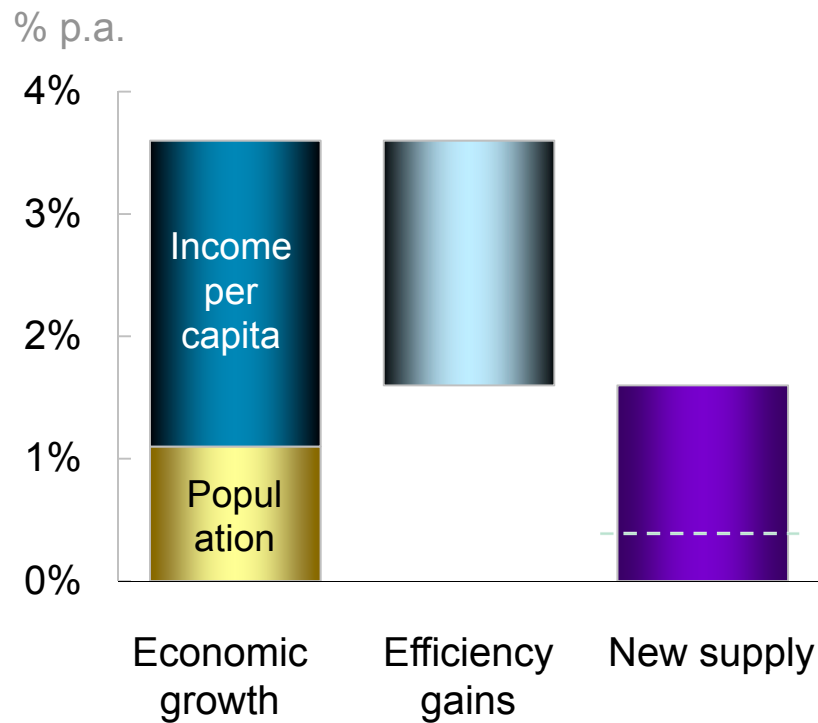
CO₂ emissions and primary energy



Growth of CO₂ emissions



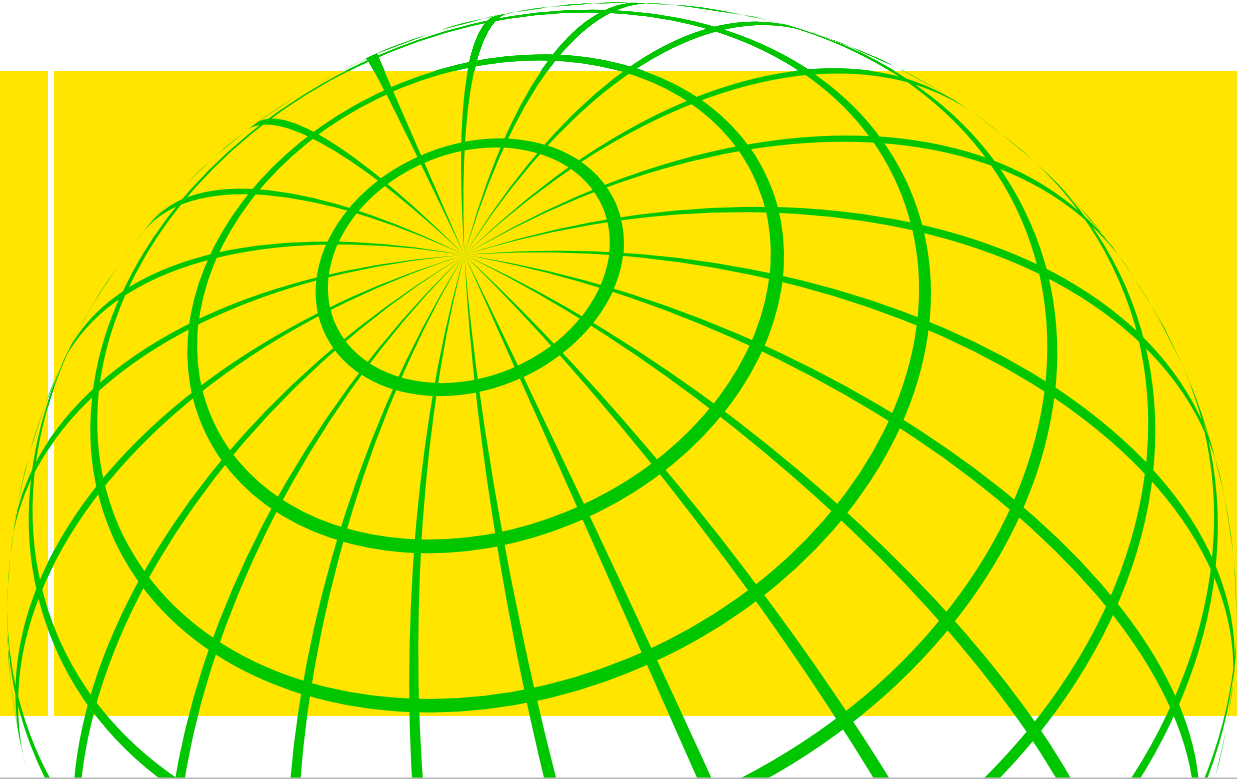
Conclusion



- Economic growth needs energy
- Competition and innovation are the key to meeting this need
 - energy efficiency
 - new supplies
- Wide ranging implications

January 2013

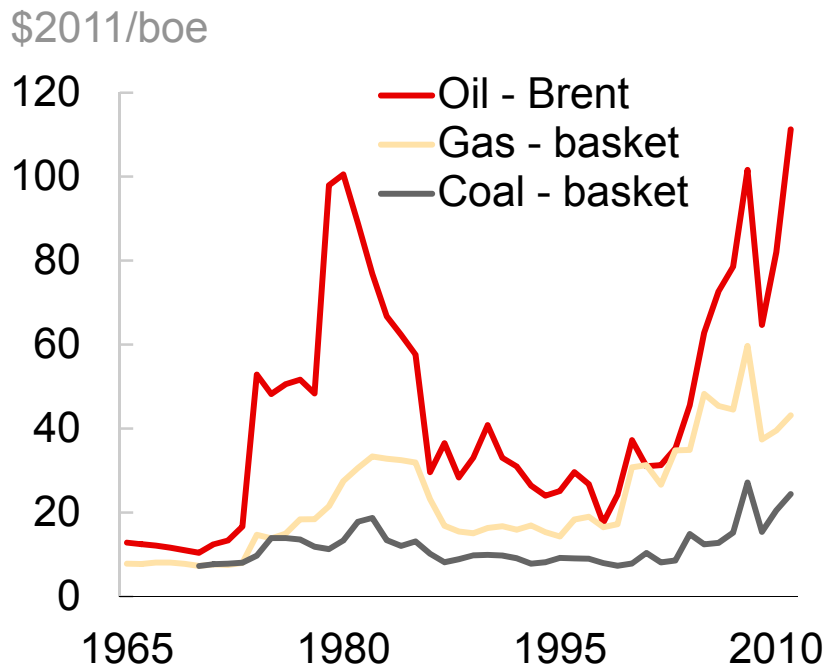
BP Energy Outlook 2030



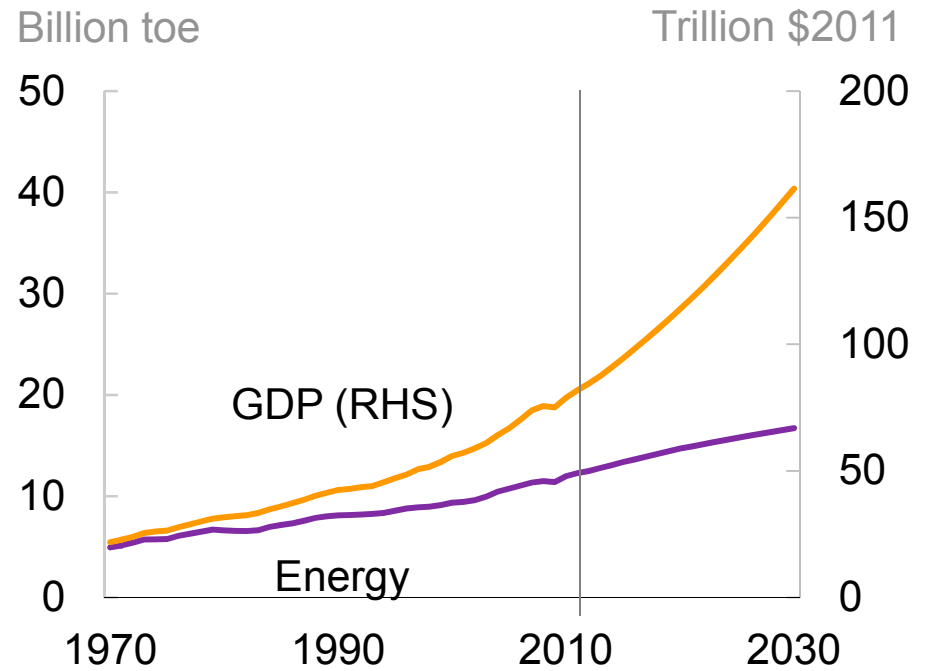
Energy: prices demand growth



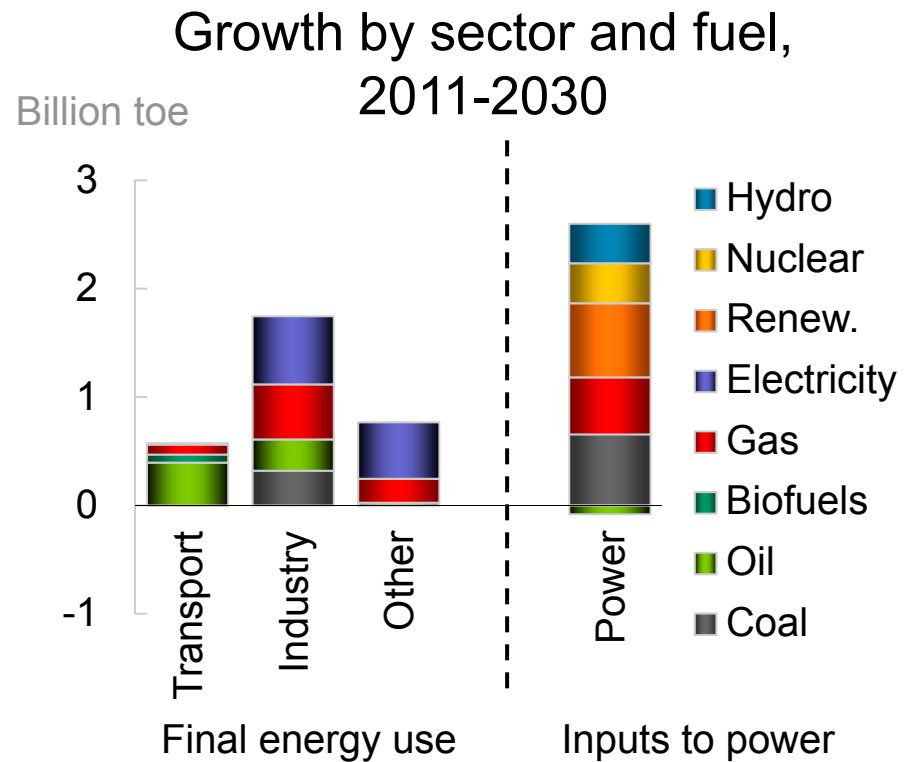
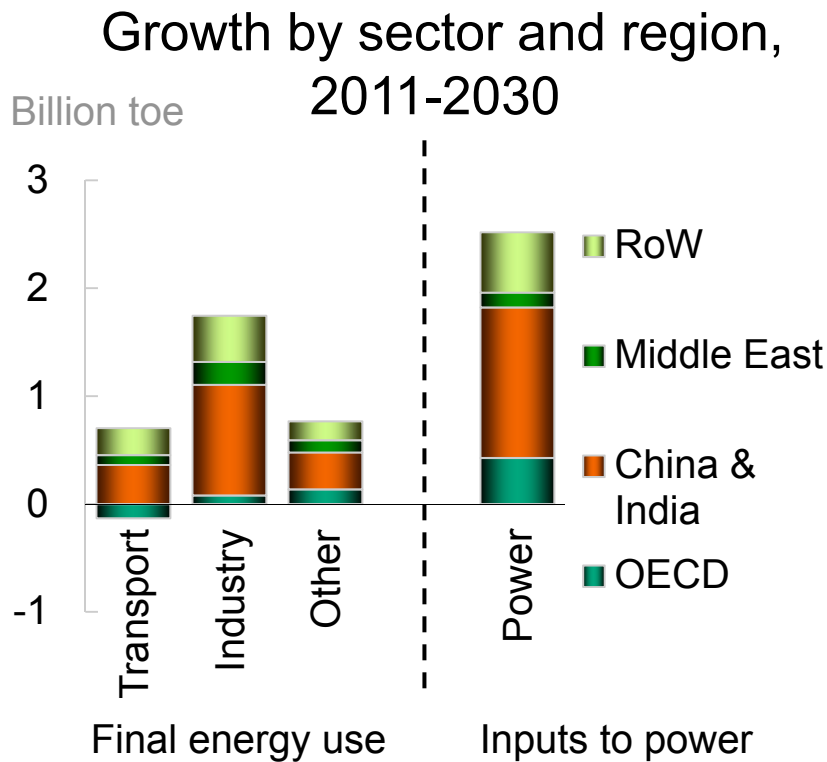
Energy prices



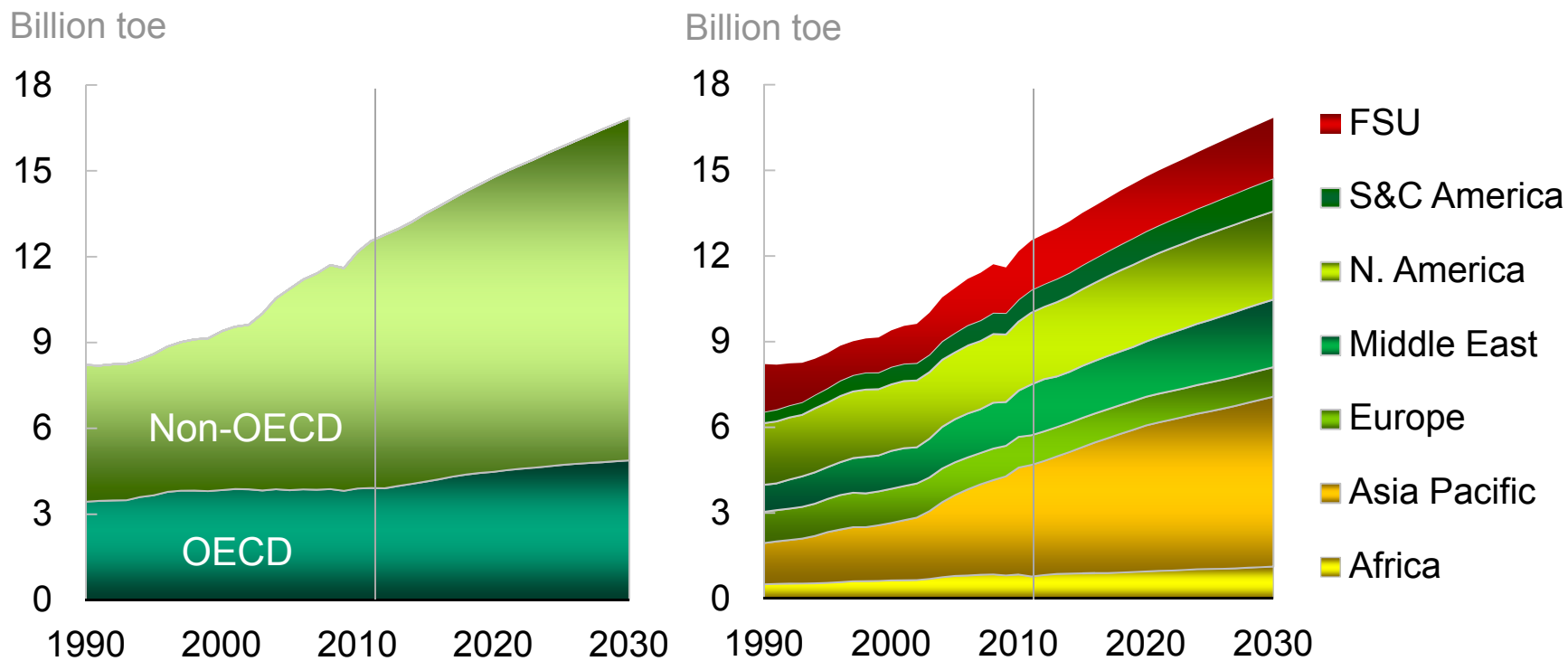
Energy and GDP



The power sector leads primary energy growth



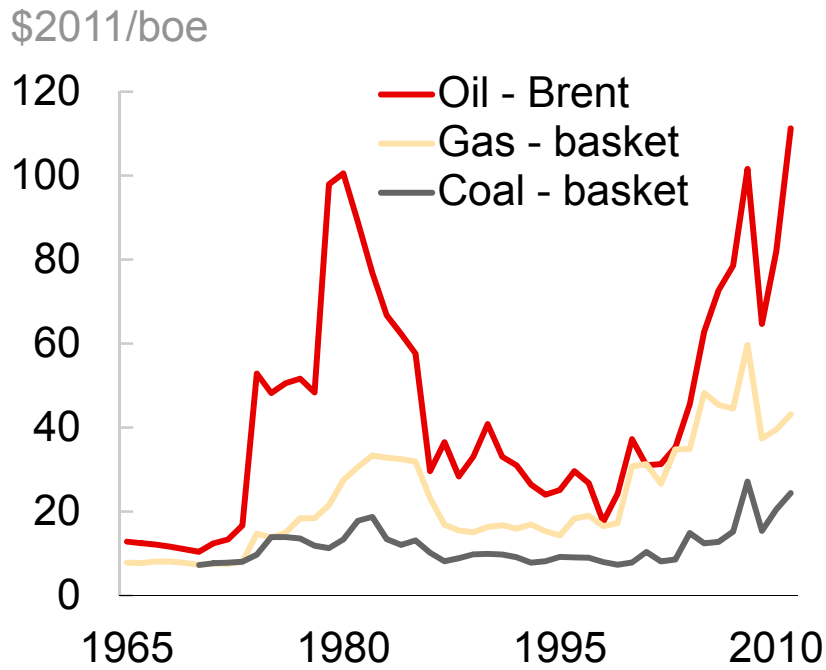
Emerging economies dominate energy production



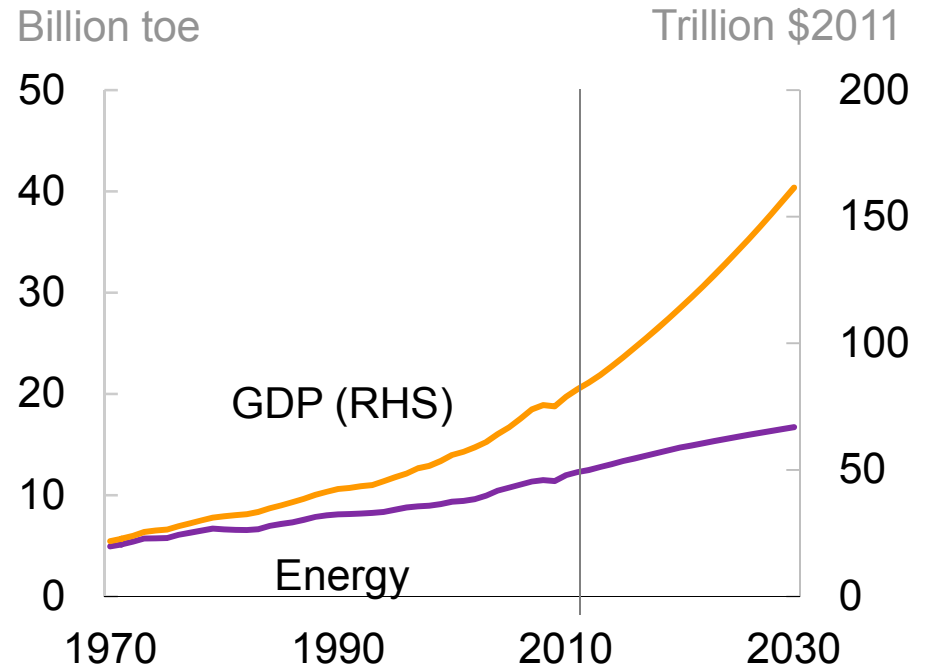
Energy: prices demand growth



Energy prices



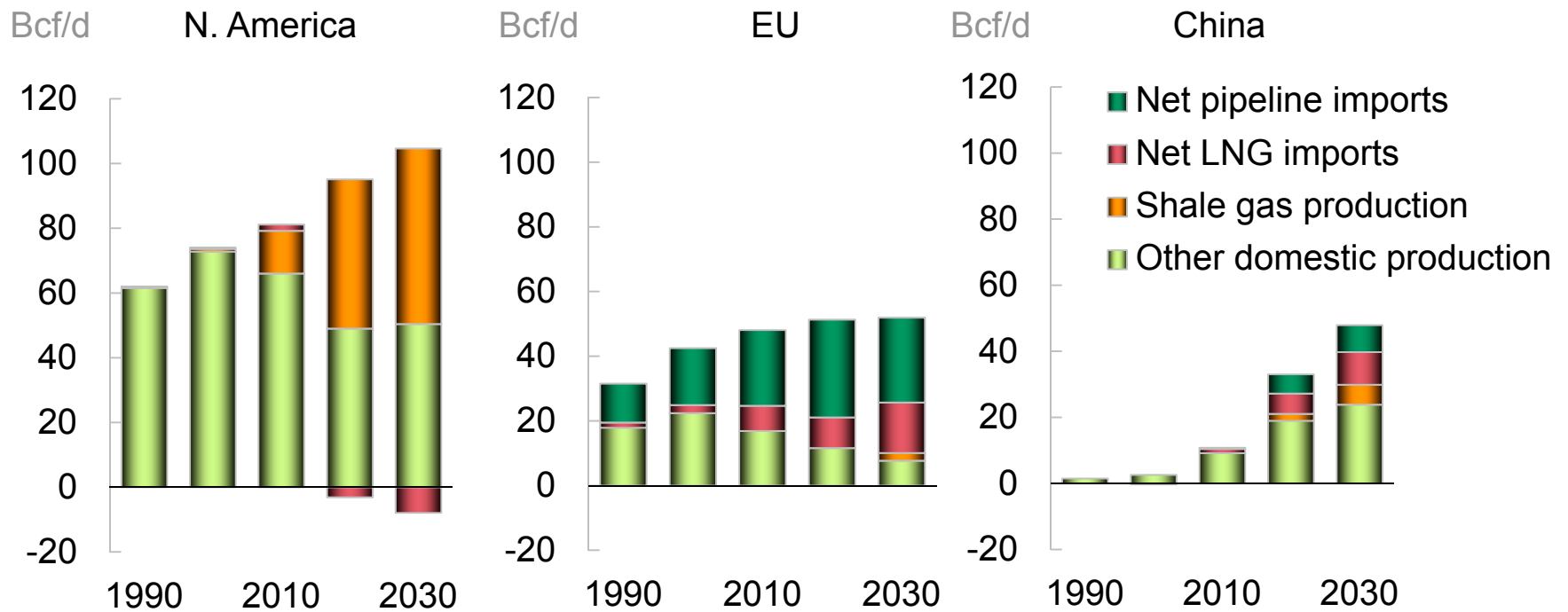
Energy and GDP



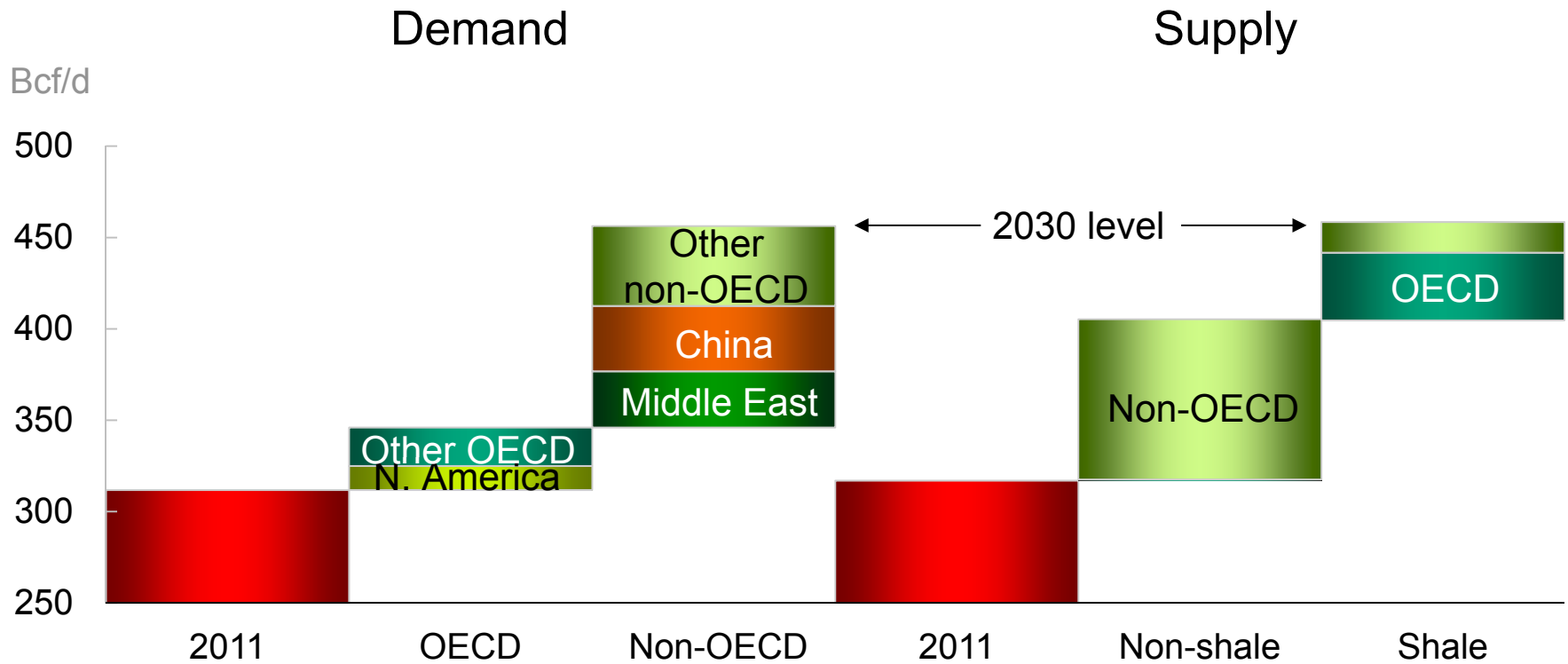
Shale gas: regional growth



Sources of gas supply, by region



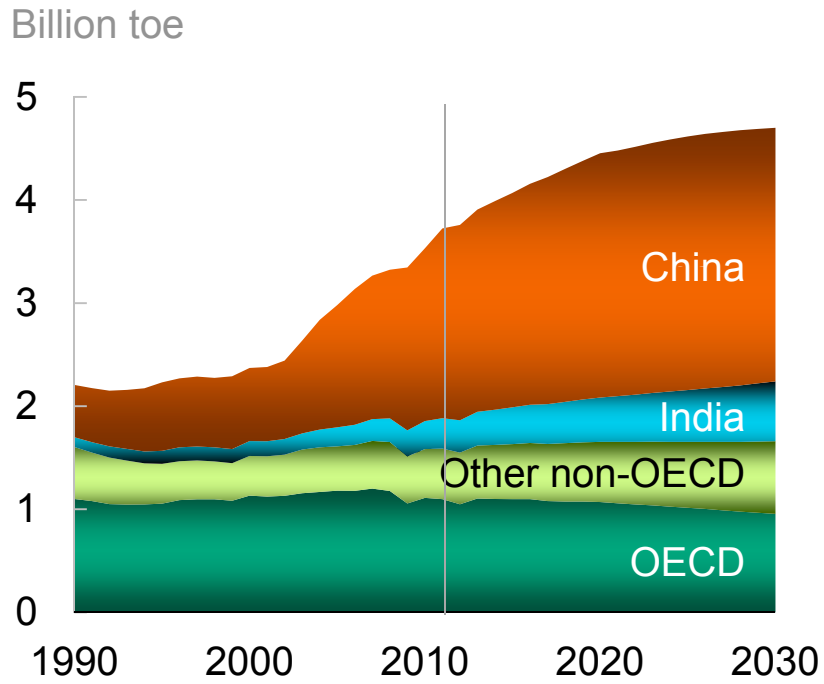
Global gas balance



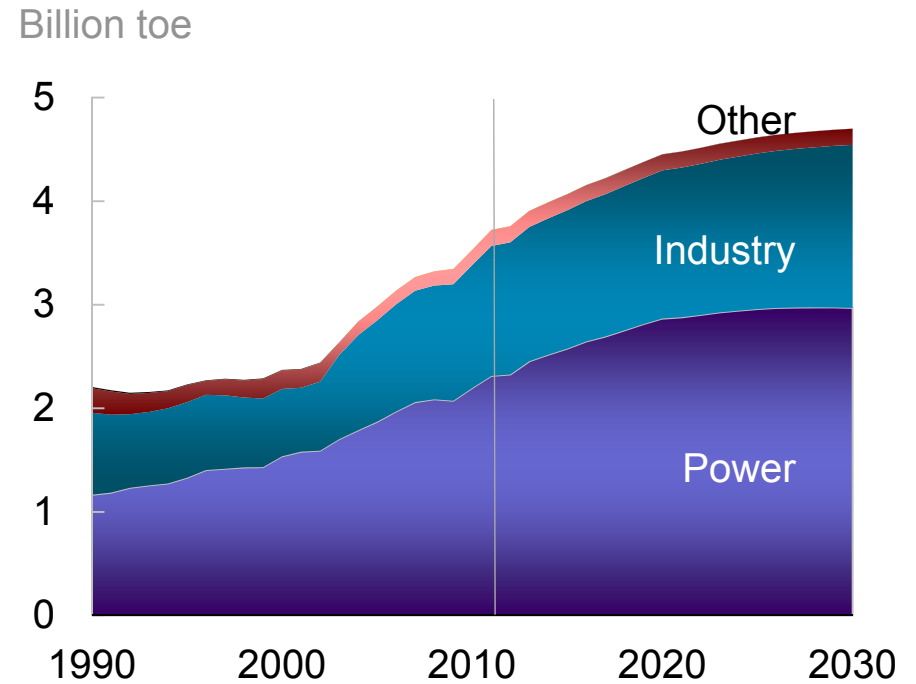
Coal consumption



Coal demand by region



Coal demand by sector

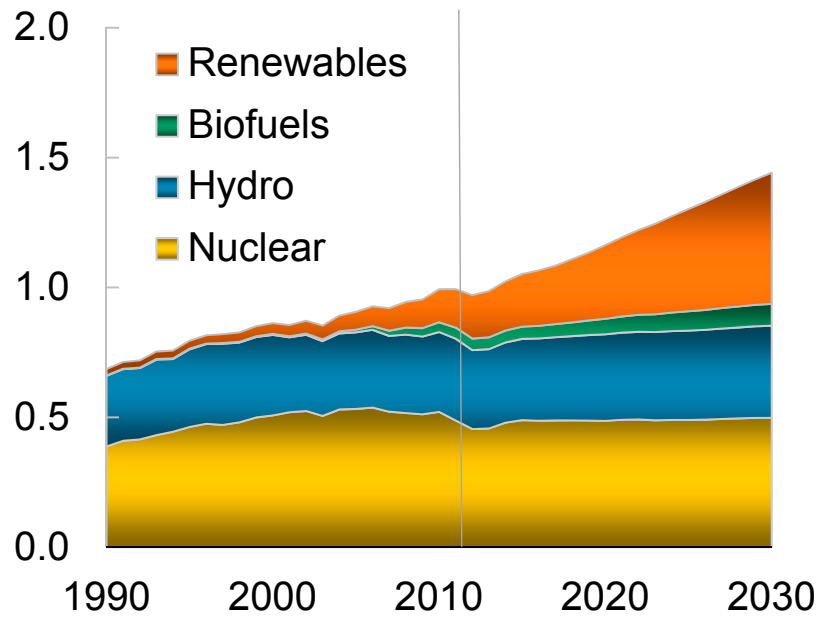


Non-fossil fuels



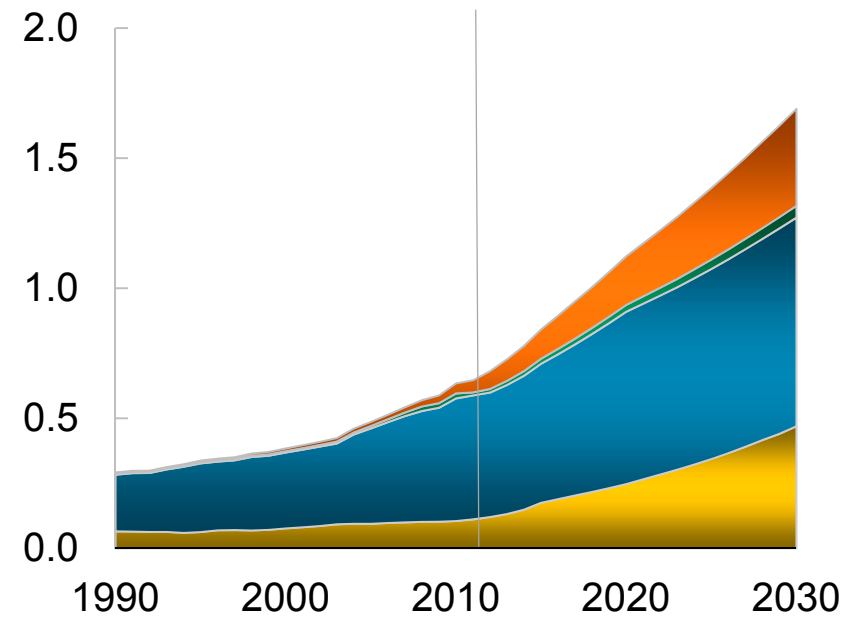
OECD

Billion toe



Non-OECD

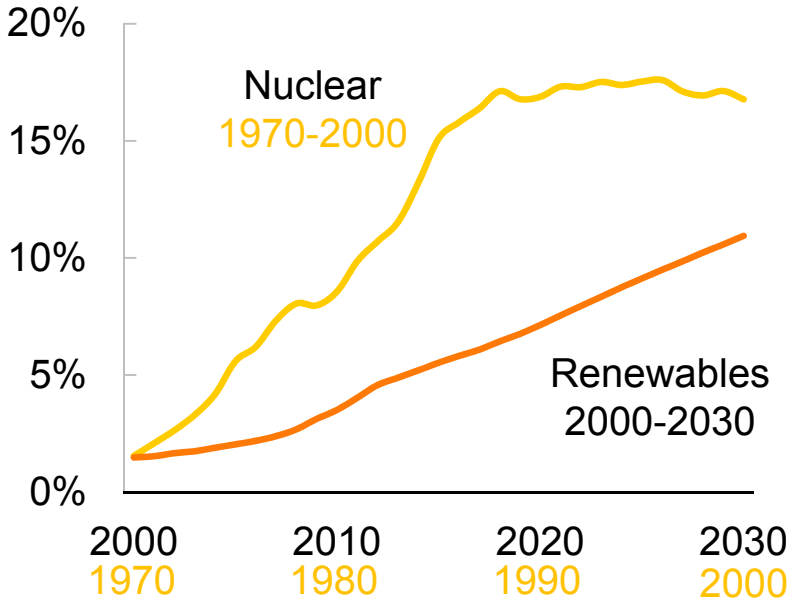
Billion toe



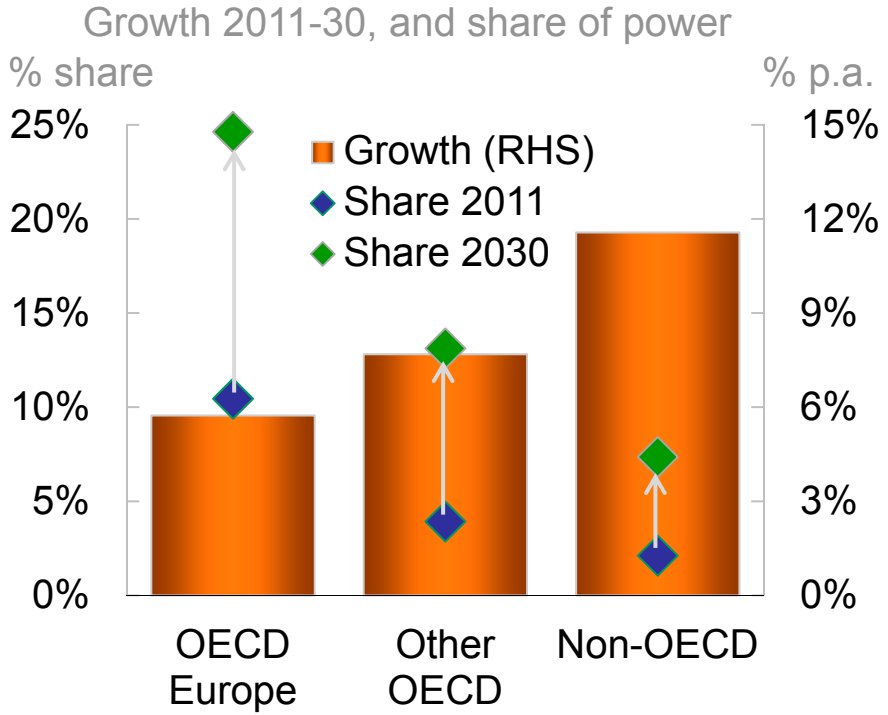


Growth of renewables in power

Share of power generation



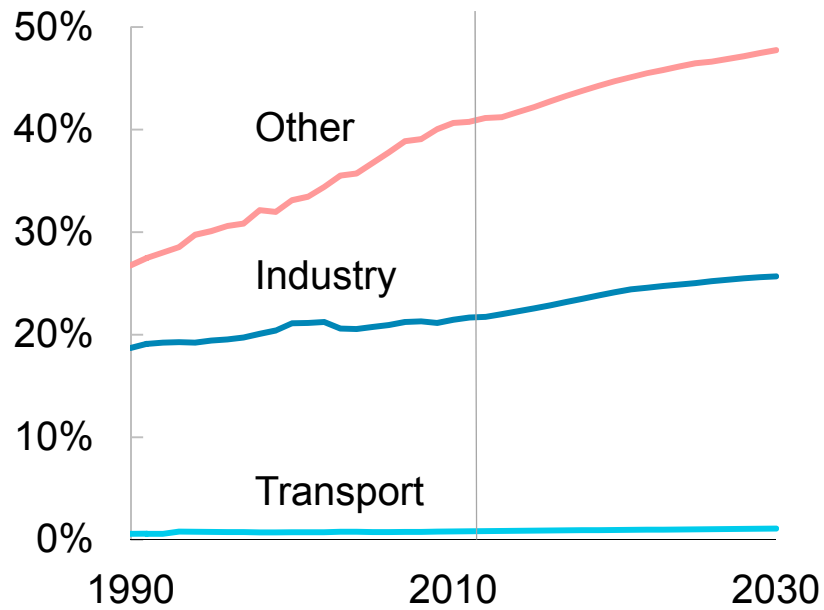
Renewable power



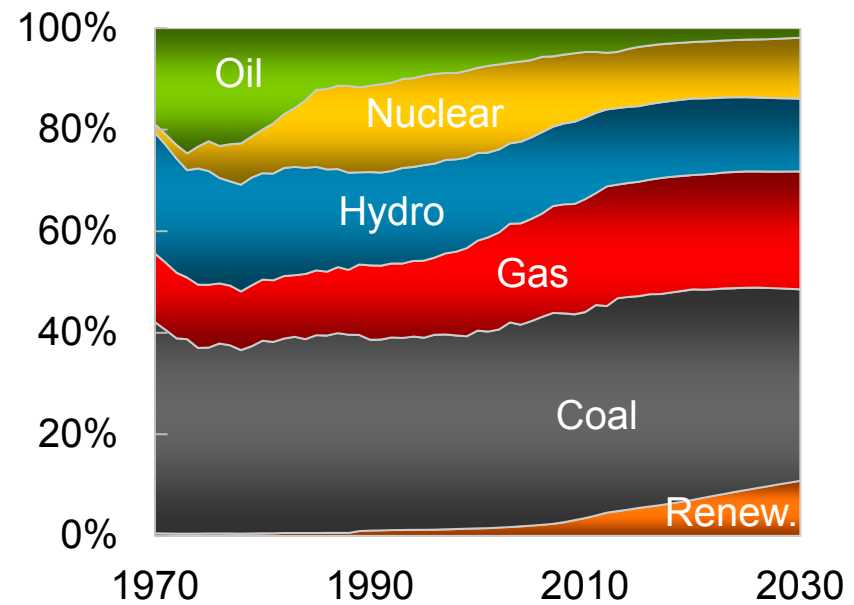
Power generation and electricity use



Electricity share of final consumption



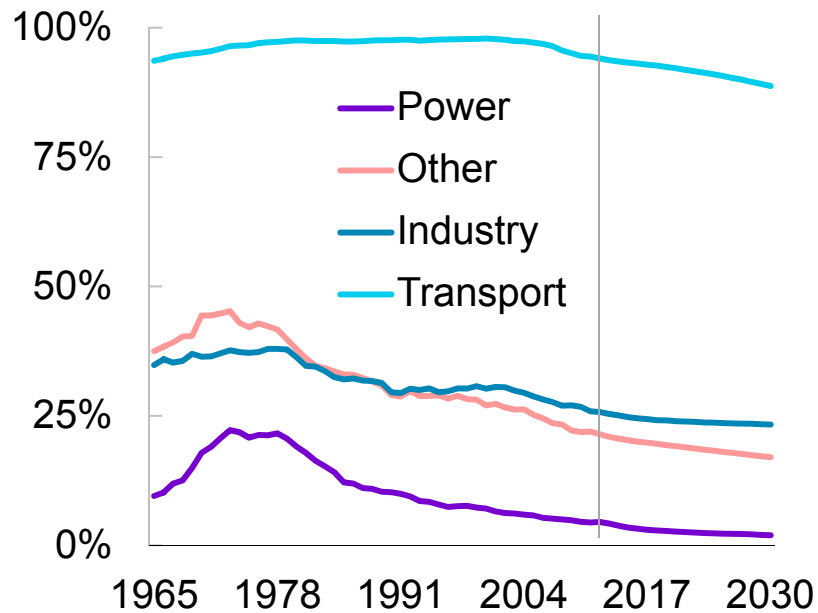
Shares of power output



High oil prices are reducing oil's share of primary energy



Oil share in sector



Fuel economy of new cars

Litres per 100 km

